

CLAIMS

1. A device for measuring the flow of a fluid comprising
 - a primary duct,
 - a bypass parallel to said primary duct, said bypass having a first section and a second section
 - a flow sensor arranged at said bypass,
 - wherein the first section of the bypass generates a pressure drop $\Delta p_1 = c_1 \cdot v_b + c_2 \cdot v_b^2$ with $c_2 \neq 0$, wherein v_b is the flow rate in the first section,
 - and wherein the second section of the bypass comprises at least two secondary ducts arranged in parallel, wherein the secondary ducts are arranged in series to the first section.
2. The device of claim 1 wherein the flow sensor is arranged in the second section.
3. The device of claim 2, where the second section is, as seen in a flow direction of the fluid, arranged before the first section.
4. The device of claim 1 wherein said first section comprises a canal section an inner diameter of which changes non-continuously.
5. The device of claim 1 wherein said first section comprises a baffle plate arranged transversally to a flow direction of said fluid, wherein an opening is arranged in said plate for passage of the fluid.
6. The device of claim 1 comprising a first and a second secondary duct arranged in said second section, wherein the flow sensor is arranged at the first secondary duct.

7. The device of claim 6 wherein the first secondary duct has a diameter smaller to or equal to a diameter of the second secondary duct.

8. Device of claim 6 wherein said first secondary duct has an entry end for entry of the fluid and an exit end for exit of said fluid, wherein said flow sensor is arranged closer to said exit end than to said entry end.

9. The device of claim 1 wherein a pressure drop over the primary duct is approximately given by

$$\Delta p = \eta \cdot K_{h1} \cdot v_h + \rho \cdot K_{h2} \cdot v_h^2,$$

wherein η and ρ are the viscosity and density of the fluid and v_h the flow rate in the primary duct, and wherein the pressure drop over the bypass is approximately given by

$$\Delta p = \eta \cdot K_{b1} \cdot v_b + \rho \cdot K_{b2} \cdot v_b^2,$$

wherein v_b is the flow rate in the bypass and wherein K_{h1} , K_{h2} , are the linear and quadratic flow resistances in the primary duct and K_{b1} , K_{b2} the linear and quadratic flow resistances in the bypass, approximately with

$$K_{b1} = n \cdot K_{h1} \quad \text{and} \quad K_{b2} = n^2 \cdot K_{h2}$$

with a constant $n > 1$.

10. The device of claim 1 wherein the bypass is formed by a housing, said housing comprising

a first housing part having openings for being connected with the primary duct and recesses for forming the bypass and

a second housing part covering the recesses of the first housing part.

11. The device of claim 1, wherein said first section is in series to said second section.

12. A bypass for being connected to a primary duct for measuring a flow of a fluid, said bypass comprising

a flow sensor,
a first section generating a pressure drop $\Delta p_1 = c_1 \cdot v_b + c_2 \cdot v_b^2$ with $c_2 \neq 0$, wherein v_b is the flow rate in the first section, and
a second section arranged in series to the second section,

wherein the second section comprises at least two secondary ducts arranged in parallel, wherein the secondary ducts are arranged in series to the first section.